

**AMENDMENTS TO THE CLAIMS**

*Please amend the Claims as follows:*

1. (Currently Amended) A method for reducing DC offset associated with a receiver comprising the steps of:

(a) receiving a signal burst samples,  $r(n)$ ;

(b) storing said received burst samples,  $r(n)$ , in memory;

(c) averaging said stored burst samples,  $r(n)$ , and calculating an initial DC offset,  $A_0$ , from the stored burst samples;

(d) removing DC offset value from stored burst samples as follows:  $r(n) - A_0$ ;

(e) estimating an updated DC offset,  $A_1$ , and a channel impulse response (CIR),  $\hat{h}$ , via a perturbed least squares (LS) CIR estimation representation modeling received burst samples  $r(n)$  as follows:

$$r_j = \sum_{i=0}^{L-1} h_i t_{j-i} + f_j m + z_j$$

where  $h_i$  are CIR taps,  $t_j$  are known training sequence symbols,  $f_j$  is a generic function of  $j$ ,  $m$  is static DC offset; and  $z_j$  is additive white Gaussian noise, and

(f) removing updated DC offset from stored burst samples as follows:  $r(n) - A_0 - A_1$ .

2. (Original) A method as per claim 1, wherein said function  $f_j$  satisfies the following conditions:

$$\sum_{j=L-1}^{25} f_j^H t_{j-k} \rightarrow 0, \forall k = (0, 1, \dots, L-1), \text{ and}$$

$$\frac{\sum_{j=L-1}^{25} f_j^H}{\sum_{j=L-1}^{25} |f_j|^2} - 1 \rightarrow 0$$

3. (Original) A method as per claim 1, wherein said receiver is an EDGE receiver.

4. (Original) A method as per claim 1, wherein said method for reducing DC offset is implemented in its entirety in a digital domain.

5. (Original) A method as per claim 1, wherein said function  $f_j$  is given by  $f_j = \sum_p e^{\frac{i2\pi j}{k_p}}$ ,

where  $p$  is the number of factors for the function and  $k_p$  is an integer.

6. (Currently Amended) An article of manufacture comprising a computer user medium having computer readable code embodied therein for reducing DC offset associated with a receiver, said medium comprising:

- (a) computer readable program code receiving a signal burst samples,  $r(n)$ ;
- (b) computer readable program code storing the received burst samples,  $r(n)$ , in memory;
- (c) computer readable program code averaging said stored burst samples,  $r(n)$ , and calculating an initial DC offset,  $A_0$ , from the stored burst samples;
- (d) computer readable program code removing DC offset value from stored burst as follows:  $r(n) - A_0$ ;
- (e) computer readable program code estimating an updated DC offset,  $A_1$ , and a channel impulse response (CIR),  $\hat{h}$ , via a perturbed least squares (LS) CIR estimation representation modeling received burst samples  $r(n)$  as follows:

$$r_j = \sum_{i=0}^{L-1} h_i t_{j-i} + f_j m + z_j$$

where  $h_i$  are CIR taps,  $t_j$  are known training sequence symbols,  $f_j$  is a generic function of  $j$ ,  $m$  is static DC offset; and  $z_j$  is additive white Gaussian noise, and

- (f) computer readable program code removing updated DC offset from stored burst as follows:  
 $r(n) - A_0 - A_1$ .

7. (Currently Amended) A method for reducing DC offset associated with a receiver comprising the steps of:

(a) receiving a-signal burst samples,  $r(n)$ ;

(b) storing said received burst samples,  $r(n)$ , in memory;

(c) averaging said stored burst samples,  $r(n)$ , and calculating an initial DC offset,  $A_0$ , from the stored burst samples;

(d) removing DC offset value from stored burst samples as follows:  $r(n) - A_0$ ;

(e) identifying a rough timing estimate defining a position of largest channel impulse response (CIR) tap via cross-correlating stored burst data with a training sequence;

(f) performing fine CIR synchronization to identify taps to be added to said identified largest CIR tap;

(g) estimating an updated DC offset,  $A_1$ , and a CIR,  $\hat{h}$ , via a perturbed least squares (LS) CIR estimation representation modeling received burst samples  $r(n)$  as follows:

$$r_j = \sum_{i=0}^{L-1} h_i t_{j-i} + f_j m + z_j$$

where  $h_i$  are CIR taps,  $t_j$  are known training sequence symbols,  $f_j$  is a generic function of  $j$ ,  $m$  is static DC offset; and  $z_j$  is additive white Gaussian noise, and

(h) removing updated DC offset from stored burst samples as follows:  $r(n) - A_0 - A_1$ .

8. (Original) A method as per claim 7, wherein said function  $f_j$  satisfies the following conditions:

$$\sum_{j=L-1}^{25} f_j^H t_{j-k} \rightarrow 0, \forall k = (0,1,\dots,L-1), \text{ and}$$

$$\frac{\sum_{j=L-1}^{25} f_j^H}{\sum_{j=L-1}^{25} |f_j|^2} - 1 \rightarrow 0$$

9. (Original) A method as per claim 7, wherein said receiver is an EDGE receiver.

10. (Original) A method as per claim 7, wherein said function  $f_j$  is given by  $f_j = \sum_p e^{\frac{i2\pi j}{k_p}}$ ,

where  $p$  is the number of factors for the function and  $k_p$  is an integer.

11. (Original) A method as per claim 7, wherein said method for reducing DC offset is implemented in its entirety in a digital domain.

12. (Original) A communication system wherein information is transmitted through a channel having a discrete channel impulse response (CIR) to produce at an output of the channel, a signal,  $r_j$ , where:

$$r_j = \sum_{i=0}^{L-1} h_i t_{j-i} + f_j m + z_j$$

where  $h_i$  are CIR taps,  $t_j$  are known training sequence symbols,  $f_j$  is a generic function of  $j$ ,  $m$  is static DC offset; and  $z_j$  is additive white Gaussian noise, such system comprising:

a receiver for receiving transmitted information, said receiver having a processor programmed to identify a DC offset estimate and a CIR estimate, said function  $f_j$  that reduces estimation error while keeping model mismatch error low, and said processor identifying said function  $f_j$  satisfying the following conditions:

$$\sum_{j=L-1}^{25} f_j^H t_{j-k} \rightarrow 0, \forall k = (0,1,\dots,L-1), \text{ and}$$

$$\frac{\sum_{j=L-1}^{25} f_j^H}{\sum_{j=L-1}^{25} |f_j|^2} - 1 \rightarrow 0$$

13. (Original) The system of claim 12, wherein said receiver is an EDGE receiver.

14. (Original) The system of claim 12, wherein said function  $f_j$  is given by  $f_j = \sum_p e^{\frac{i2\pi j}{k_p}}$ , where

$p$  is the number of factors for the function and  $k_p$  is an integer.

15. (Original) An article of manufacture comprising a computer usable medium having computer readable program code embodied therein aiding a receiver in receiving transmitted

information, said information is transmitted through a channel having a discrete channel impulse response (CIR) to produce at an output of the channel, a signal,  $r_j$ , where:

$$r_j = \sum_{i=0}^{L-1} h_i t_{j-i} + f_j m + z_j$$

where  $h_i$  are CIR taps,  $t_j$  are known training sequence symbols,  $f_j$  is a generic function of  $j$ ,  $m$  is static DC offset; and  $z_j$  is additive white Gaussian noise, such medium comprising:

computer readable program code identifying said function  $f_j$  that reduces estimation error while keeping model mismatch error low, and

said computer readable program code identifying said function  $f_j$  satisfying the following conditions:

$$\sum_{j=L-1}^{25} f_j^H t_{j-k} \rightarrow 0, \forall k = (0, 1, \dots, L-1), \text{ and}$$

$$\frac{\sum_{j=L-1}^{25} f_j^H}{\sum_{j=L-1}^{25} |f_j|^2} - 1 \rightarrow 0$$

16. (Original) An article of manufacture of claim 15, wherein said receiver is an EDGE receiver.

17. (Original) An article of manufacture of claim 15, wherein said function  $f_j$  is given by

$$f_j = \sum_p e^{\frac{i2\pi j}{k_p}}$$

where  $p$  is the number of factors for the function and  $k_p$  is an integer.

18. (Currently Amended) An integrated circuit implemented in conjunction with a receiver in a communications system for reducing DC offset associated with said receiver, said integrated circuit comprising:

(a) an interface to receive a signal burst samples,  $r(n)$ ;

(b) memory to store said received burst samples,  $r(n)$ ;

(c) an averaging component to average said stored burst samples,  $r(n)$ , calculate an initial DC offset,  $A_0$ , from said stored burst samples, and remove said initial DC offset value from stored burst samples as follows:  $r(n) - A_0$ ;

(d) a perturbed least squares channel impulse response (LS CIR) estimator to estimate an updated DC offset,  $A_1$ , and a ~~channel impulse response (CIR)~~,  $\hat{h}$ , via a perturbed least square (LS) CIR estimation representation modeling received burst  $r(n)$  as follows:

$$r_j = \sum_{i=0}^{L-1} h_i t_{j-i} + f_j m + z_j$$



where  $h_i$  are CIR taps,  $t_j$  are known training sequence symbols,  $f_j$  is a generic function of  $j$ ,  $m$  is static DC offset; and  $z_j$  is additive white Gaussian noise, and removing updated DC offset from stored burst as follows:  $r(n) - A_0 - A_1$ .

19.(Original) An integrated circuit implemented in conjunction with a receiver in a communications system for reducing DC offset associated with said receiver, as per claim 18, wherein said receiver is an EDGE receiver.

20.(Original) An integrated circuit implemented in conjunction with a receiver in a communications system for reducing DC offset associated with said receiver, as per claim 18,

wherein said function  $f_j$  is given by  $f_j = \sum_p e^{\frac{i2\pi j}{k_p}}$ , where  $p$  is the number of factors for the function and  $k_p$  is an integer.